THE REVIEW

DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR STEEL TREATING

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DETROIT HAS FINAL TECHNICAL MEETING

Dr. Grossmann Talks on Grain Size and Alloy Elements

By O. W. McMullan

The last technical meeting of the year for the Detroit chapter was held in the Hotel Fort Shelby on April 11. The dinner was followed by entertainment and announcement of new officers.

The technical talk was given before a packed house by Dr. Marcus Grossmann, research engineer, Illinois Steel Co. on the subject, "Alloying Elements and Grain Size in Steels." Mr. Grossmann mentioned other properties but confined his remarks mostly to the effect on mechanical properties. The properties obtained by treatment can be affected by changing the hardening characteristics or the speed of quenching. The important range in cooling is between 1300 and 700° F. and the difference in cooling rates for various media is not great over this range, the difference being less than 10 to 1. The hardening characteristics can be changed from 1000 to 1 or even 1,000,000 to 1 by changing the steel.

Hardened structures of alloys are similar to those of plain carbon steels and are martensitic or pearlitic. Dr. Grossmann classified troostite as fine grained pearlite. Equilibrium structures may be greatly affected. Thus with over 3% silicon or 13% chromium, gamma iron is completely eliminated in the absence of carbon and only alpha and delta iron exist. One per cent of aluminum, 1.7% of vanadium, 6.5% tungsten, 5.5% molybdenum, and 0.20% phosphorus has the same effect. The presence of carbon greatly increases these percentages. Nickel, manganese, and cobalt favor the formation of austenite. Most of the alloying elements reduce the carbon content necessary to form the eutectoid.

Dr. Grossmann distinguisned between the actual grain size of the finished article and the grain size rating by the McQuaid-Ehn test. The mechanical properties of a single grain are greatly different from a mass of grains. Single grains of iron have no yield point and probably no proportional limit.

One curve showed a maximum in proportional limit at a grain size of about 75 per square millimeter. Finest grained materials have the most pronounced yield point. Coarse grained steels are generally more brittle, but not always, as high finishing temperatures in hot working may result in brittleness even after heat treatment. The difference between fine grained and coarse grained steels was attributed to interference at the grain boundaries. Coarse grained steels have greater magnetic permeability and coarse transformer irons show lower watt loss. Low carbon steels are tougher when fine grained, and when carburized, the core rather than the case determines toughness. Fine grained steels usually do not harden as deeply as coarse grained steels.

The discussion was led by Mr. McQuaid who showed some slides and pointed out that the grain size was determined in the steel making and could not thereafter be changed. It was agreed that the submicroscopic particles of oxides such as aluminum or vanadium act as centers of crystallization to determine grain size. Dr. Grossmann stated that this was complicated by the fact that such oxides are partially soluble in the steel. The much discussed question of normality came up. Abnormality reduces the hardening capacity due, as Dr. Grossmann mentioned, to the dissolved oxygen, but also partly due to vanadium and probably aluminum by increasing the transformation rate.

R. & H. OFFICERS CHANGED

At a recent directors' meeting of the Roessler & Hasslacher Chemical Co., Inc., Dr. H. R. Carveth, president of the company, announced his retirement as president and director of the company and as a director of E. I. du Pont de Nemours & Co., Inc., of which R & H is a subsidiary. Dr. M. J. Brown, vice-president and director of R & H also resigned all positions with the company. Charles K. Davis of New York was elected president to succeed Dr. Carveth. He will also be general manager of the company. Dr. E. A. Rykenboer, formerly vice-president of the company will be vice-president and assistant general manager.

TRI-CITY HEARS ADVANTAGES FROM CARBURIZING WITH GAS

R. J. Cowan is Speaker April 5

By R. H. Lind

R. J. Cowan of Surface Combustion Co., Toledo, Ohio, gave an illustrated talk on "Gas Carburizing" before 50 members of the Tri City chapter at the Fort Armstrong Hotel in Rock Island, April 5.

Mr. Cowan discussed in detail the five furnace zones: preheat zone which brings the work up to temperature before entering the furnace proper; the decomposition zone in which the gas is decomposed and the carbon film deposited on the work; the carburizing zone in which carburization takes place; the diffusion zone in which the carbon is diffused into the metal forming the proper case; and the holding zone in which the temperature of the work can be raised or lowered and held at any temperature desirable for a subsequent operation.

Ease of control, uniformity of product, speed, and cleanliness enable the manufacturer to place this furnace in the line of production, reduce costs and afford better working conditions.

Harold Marcussen gave a brief interesting review of his many experiences and conditions in Russia as he saw them while an engineer for the Russian government, the past two years. He left a very negative desire for anyone to join the communist movement.

BOILER WELDING IS HARTFORD SUBJECT

E. R. Fish Also Tells Metals Suited for High Pressure

By J. Allison

E. R. Fish, chief engineer, boiler division, Hartford Steam Boiler Inspection & Insurance Co., gave a most interesting illustrated talk on "Pressure Containers as Influenced by Men, Methods and Materials," at the April 12 meeting of the Hartford chapter.

J. H. G. Williams, as technical chairman, introduced the speaker.

Pressures of 200 to 225 lbs. per sq. in. were the highest used until the steam turbine came into use. There is one plant now using, successfully, a pressure of 1840 lbs. per sq. in.

Welding was not at first dependable and the attempt to qualify for this class of work was a great factor in bringing about the enormous improvements in welding.

Material for boilers has lately been much improved. KA2 has been used satisfactorily, especially for paper pulp digesters. Cromansil and Everdur have good properties for high pressure work. A material must be easily worked and easily welded for this application.

Welding is the coming method for high pressure vessel joints. Some shops have developed a welding technique which gives a uniformly sound weld for plates up to ¾" in thickness. Insurance companies compel the fabricating shops to meet certain standards of construction as a prerequisite to obtaining insurance on their boilers. Qualification tests for welders are required and many shops require the welder to stamp his identification number on his work.

During the discussion, W. D. Halsey, assistant chief engineer of the Hartford Steam Boiler Inspection & Insurance Co., gave a few pointers on welding.

Too long or too short an arc will produce lack of fusion. A very long arc casts metal but does not insure fusion. The correct length of arc for bare wire is not correct for coated wire. The coated wire is more fool-proof, is hotter, and gives better penetration. The coating leaves a slag which protects the weld from the atmosphere upon cooling but it will have a deleterious effect in service and should be thoroughly cleaned.

Evolution of gas in the cooling metal causes porosity, as does a short arc. The bottom of the V weld, made first in a double V weld, must be thoroughly cleaned on the under side before the second V weld is made or a porous section will remain between the welds.

In reply to questions it was stated that welds are strain relieved if the ratio of diameter to the cube of the thickness is over 100.

PLANS ANNOUNCED BY A. S. S. T. FOR METAL CONGRESS

Interesting Sessions Planned; Show Space Selling Well

Technical programs of unusual quality will be sponsored by the 8 societies and divisions cooperating in the Fourteenth Annual National Metal Congress and Exposition in Buffalo, the week of October 3rd.

The A.S.S.T. sessions will contain a wide range of both practical and research papers, according to Ray T. Bayless, assistant secretary of the Society in charge of technical activities. The program this year will be divided into sessions which will deal with the following topics: reports of metallurgical research; nitriding; drop forging; corrosion resistant steels; sheet steel; high speed steels; deep acid etching of steels; and heat treatment.

Technical programs for the National Metal Congress are also being arranged by the American Welding Society; Iron and Steel and Institute of Metals Divisions of the American Institute of Mining and Metallurgical Engineers; Iron and Steel Divisions of the American Society of Mechanical Engineers; Production Activity Division of the Society of Automotive Engineers; the Wire Association; and the Drop Forging Institute.

Definite information on these programs will be made available later.

Advance space reservations for the National Metal Exposition have more than exceeded expectations, W. H. Eisenman secretary of the A.S.S.T. and director of the Exposition, has announced. This will be the first National Metal Exposition to be held in the Buffalo territory and this feature has proven particularly attractive.

To date over 80 firms have reserved exhibit space and the roster is increasing daily.

BUFFALO HEARS 5 LOCAL MEN SPEAK

Petrie, Sherlock, Llewelyn, Cutler and McCarthy Talk

By Clyde Llewelyn

A regular meeting of the Buffalo chapter was held at the Buffalo Hotel on April 14. Dinner was served to 32 members and guests and there were 84 present at the regular meeting which followed.

The meeting was called to order by Chairman J. H. Birdsong, who gave a brief talk on affairs of the chapter and the National Metal Congress and Exposition to be held in Buffalo, Oct. 3-7. He then explained that this was to be local talent night and that five different members of the chapter would talk on some phase of the metal industry. The speakers and their subjects were as follows:

J. W. Petrie, metallurgist, Pierce Arrow Motor Car Co., "Automotive Steels"; R. E. Sherlock, metallurgist, Republic Steel Corp., "Die Rolled Products"; Clyde Llewelyn, metallurgist, Bliss & Laughlin, Inc., "Cold Finished Steel"; H. J. Cutler, engineer of tests, Bethlehem Steel Co., "Metallurgical Inspection"; B. L. McCarthy, metallurgist, Wickwire-Spencer Steel Corp., "Wire Drawing."

This type of meeting was an innovation and it seemed to meet with popular favor, as it permitted discussion of numerous more or less allied metal products.

Mr. Sherlock supplemented his talk with motion pictures, showing the preparation of rolls and the actual rolling and finishing of hot rolled automobile axles. Mr. McCarthy had a number of very good slides showing good and bad structures, defects and conditions encountered in wire drawing, which fitted in very nicely with his talk. The other subjects were covered by the speakers without any slides or motion pictures.

At the conclusion of each talk, the meeting was thrown open for discussion and a lot of interest was displayed, as evidenced by the fact that the meeting did not break up until nearly midnight.

KESHIAN OUTLINES DEEP ETCH TO 122 NEW JERSEY MEMBERS

Explains Process and Results

By J. Sammon

H. G. Keshian, metallurgist of Chase Companies, Inc., Waterbury, Conn., was the speaker at the April 4 meeting of the New Jersey chapter at the Elks Club in Newark.

A group of 122 heard Mr. Keshian discuss "Deep Etching" on which he is an authority, being chairman of the Sub-Committee of A.S.S.T. on this subject.

Mr. Keshian explained that he did not want his listeners to go away with the impression that he advocated deep etching in preference to other tests, but that in the case of forged bars of any shape or length, this method is very convenient, since it only requires applying acid to the ends of the bars wherever they may happen to be.

Slides showed bars before and after etching and in most cases defects such as hairline cracks, segregated metal, and slag, not visible to the eye before etching, were plainly visible after being etched.

Before Mr. Keshian's talk, the "A_3 Transformation" film of the Harvard Engineering School was shown.

The J. Wiss & Sons Co. of Newark, N. J., cutlery manufacturers, had a very interesting exhibit of scissors, shears, snips, etc., and also showed these articles in the various stages of manufacture.

MANY METALS USED IN BUILDING SHIPS

New York Hears W. E. Blewett Discuss Ships April 11

By F. H. Clark

The April meeting of the New York chapter was held on the 11th. Dinner was served at Loft's Restaurant and the meeting held afterwards in the Woolworth Building. W. E. Blewett, assistant to the president of the Newport News Dry Dock and Shipbuilding Co., Newport News, Va., had for his subject the types of materials used in the construction of ships.

In 1819, the members were informed, the first metal ship, called the "Vulcan," was launched. It was not until 1876 that steel plates were substituted for iron. Today all ships built in this country must meet specification requirements of either Lloyd's or the American Bureau. The most serious cause of trouble in constructing ships is of course corrosion due to salt water. Corrosion of rivet holes is a source of trouble as well as corrosion due to stray currents set up in the hull during welding after the hull is launched. Mr. Blewett said that his company was using thirteen times as much welding in ship construction today as was used seven years ago.

Structural alloy steels are under consideration at the present time. Mr. Blewett stated that fatigue limits for their work was considered as 40% of the tensile strength and 50% of the torsional strength. Copper-bearing steels are of no advantage in the hull of the ship, but they may be utilized at some future time in the superstructure.

For small forgings, as in stanchions and hinges, the practice is to use a 0.15-0.20% carbon steel. For heavy forgings a 0.20-0.30% carbon steel is used. Chrome-vanadium forgings are used in crank pins and the United States Government requires a 3½% nickel steel for line shafts. Tools are of course a necessary factor in working metal.

Stainless steels find use in turbine blades, valve pins, galley work and ornamentation. The tendency today is to replace all brass fixtures on a ship with stainless steel or white metal.

In the non-ferrous field, both copper and brass pipe are used, although wrought iron pipe seems best for use with salt water. Condenser tubes of admiralty metal and black skinned admiralty metal have suffered from corrosion so that today an aluminum bronze has been substituted of 76% copper, 22% zinc and 2% aluminum.

UDDEHOLM CO. MOVES OFFICE

Uddeholm Co. of America, Inc., announces the removal of their office to 155 E. 44 St., New York City.

3 OHIO CHAPTERS HAVE BIG MEETING

See Plants and Hear Dr. F. N. Speller Discuss Corrosion

By Richard R. Kennedy

The annual tri-chapter meeting of the Columbus, Cincinnati and Dayton chapters was held at the Dayton Engineers' Club on April 14.

Large delegations from the visiting chapters arrived at noon and spent the afternoon visiting various Dayton plants, which kept open house for the day.

After a well attended dinner at the Engineers' Club, George Long of the Dayton chapter introduced the chairmen of the visiting chapters, Prof. "Jimmy" Lord of Columbus and N. M. Salkover of Cincinnati. Dr. O. E. Harder of Battelle Memorial Institute told a few of his inimitable stories and "Bill" Eisenman gave a talk in his best manner.

The principal speaker of the evening was Dr. F. N. Speller, director of research of the National Tube Co., who spoke on the subject of "Corrosion."

Dr. Speller defined corrosion as the chemical action of the environment resulting in the destruction of the metal. He described the reactions which take place in corrosion and pointed out the fact that we must know all the conditions of the environment to which a metal is to be exposed before we can predict its corrosion resistance. For example, the copper steels, which have excellent resistance to certain types of atmospheric corrosion, have very low resistance to various strong corrosive agents.

He described the mechanism of the formation of protective surface films and described their action in preventing or reducing corrosive attack.

He cited the progress, which has been made in recent years, in the development of organic coatings, such as the synthetic resins and rubber compounds, which greatly increase the life of the metals under corrosive conditions.

In conclusion, Dr. Speller stated that a few years ago, the annual cost of corrosion in America amounted to about $500,000,000, but that great strides have been made in the protection of metallic surfaces so that at the present time the annual cost of corrosion has been greatly reduced.

An animated and interesting discussion followed the lecture after which the meeting adjourned.

NORTHWEST HEARS ENGINEER TELL RUSSIAN EXPERIENCES

April Meeting Attracts Crowd

By A. C. Forsyth

The April meeting of the Northwest chapter was held at the Manufacturers Association of Minneapolis and a capacity crowd attended. E. W. Davis, superintendent of the Minnesota Mines Experiment Station was the speaker and his talk, "What I Saw in Russia," was exceptionally interesting and instructive.

Mr. Davis outlined his trip in considerable detail, describing the customs, the kind of railroad service, the hotel service, the cost of luxuries, in comparison to the necessities of life, the absence of soap, etc. He emphasized in particular the progress made in the mining and smelting of iron ores since that was the chief reason for his visit there. The lecture was quite out of the ordinary and everybody seemed well pleased.

In addition to the lecture four reels of moving pictures were shown. These pictures gave a detailed description of the continuous sheet mills and pickling processes of American Rolling Mill Co.

TOLEDO MEMBERS ORGANIZE

The Toledo members of the Detroit chapter have organized themselves into a group. They have become very active and now have a membership of 36. A meeting was held April 4 at Toledo University. H. W. McQuaid of the Timken-Detroit Axle Co. gave a talk on carburizing and the hardened structures obtained. More than 100 attended the meeting.

Leo L. Vasold is chairman; E. P. Zink, vice-chairman, and R. L. Adams is secretary.

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RAY T. BAYLESS ..... *Editor*
JOHN G. MAPES ..... *Managing Editor*

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ONTARIO HAS TALK ON GAS ATMOSPHERE

Sam Tour Tells Effect of Gas Conditions in Furnaces

The Ontario chapter held its April meeting in the Royal York Hotel, Toronto, on April 8.

Following the dinner, R. W. E. Burnaby, trade commissioner for the Maritime Provinces, gave a short talk on the eastern provinces and voiced a strong plea for a better understanding of the problems of the Maritime people.

The lecture of the evening was presented by Sam Tour, consulting metallurgical engineer, New York City, on the subject, "Furnace Atmospheres."

Mr. Tour pointed out that it is difficult to control moving atmosphere in a furnace, since the ratio of air to fuel admitted to the furnace is the determining factor both of furnace-gas composition and of temperature. It is impossible to maintain either highly oxidizing or extremely reducing conditions in such furnaces, and, further, the furnace operator's judgment of the conditions in his furnace by observations of the color of the flame is often incorrect. It was the speaker's opinion that the activity of the nascent gases, formed as a result of the combustion of the fuel in contact with the steel being treated, is responsible for much of the scaling or decarburization found in furnaces which have a predominance of reducing gases in the first case and of oxidizing gases in the second.

The quiescent or still atmosphere furnace lends itself much more readily to accurate control of atmosphere. As examples of gases which may be used to give varied furnace conditions, the speaker cited air, combusted fuel gas, cracked gas such as electrolene, ammonia gas for nitriding, dissociated ammonia, hydrogen, and liquid vapors such as methanol or oil.

The combusted fuel gas method is flexible, and by controlling the ratio of gas to air it is possible to obtain a wide range of gas composition.

A neutral atmosphere was defined as one which does not react with the steel at the temperature used. The gas composition necessary to create this condition varies with the temperature and, to a less extent, with the steel treated. A furnace atmosphere which is neutral to a steel at a definite temperature becomes definitely oxidizing at higher temperatures, and gas compositions which are neutral to high-speed steel are active to stainless steel.

The attendance prize—an electric toaster, donated by the Edgar Allen Company, of Toronto—was won by Mr. Smart, of Canada Illinois Tool Company, Limited, Toronto.

NEW STAINLESS ALLOY STEEL IS PATENTED AND ON MARKET

Works Easily Hot or Cold

Culminating 8 years of research by Ludlum Steel Co., the Associated Alloy Steel Co. has announced a new patented stainless steel alloy known as Nevastain RA.

It can be deformed hot without causing undue strains on the machines, and because it does not work harden as much as other stainless alloys, it will cold roll, draw or upset more easily, thus bringing increased production and longer die life.

Nevastain RA does not require a high temperature anneal as full ductility can be obtained at ordinary annealing temperatures. It may also be readily heat treated to high strength and hardness.

It is free machining and can be sheared, drilled, etc. by ordinary methods. It can be welded by either the gas, electric arc, flash or spot processes without grain growth.

A booklet describing its physical and fabricating properties may be secured from Associated Alloy Steel Co., Union Trust Bldg., Cleveland.

COLD HEADING PROCESSES ARE OUTLINED AT LEHIGH MEETING

C. L. Harvey Principal Speaker

By O. V. Greene

Carl L. Harvey, metallurgist of the Lamson & Sessions Co., Cleveland, in a talk before the Lehigh Valley chapter on April 1, gave a very interesting account of the cold heading process. The evolution of the industry was traced from its earliest beginnings to its present size and diversity of products.

The address included the progress of raw material as it comes into a present-day cold heading plant through the various departments and processes necessary for the production of the finished article.

Pickling, wire drawing, cold heading, trimming, shaving, threading and heat treating were discussed. The tools required for the various operations were described, as was the suitability of various steels and their heat treatment.

The talk was very interestingly illustrated. Later, in a very lively general discussion, Mr. Harvey amplified many of his points.

Harry Ladel, master mechanic of the Lamson & Sessions Co., aided considerably in answering questions of a mechanical nature.

TRI-CITY STUDIES WELDING, CUTTING

G. N. Sieger Outlines Present Status of these Processes

G. N. Sieger of the P. R. Mallory Co., Inc., Indianapolis, spoke on March 1, before about fifty members of the Tri-City chapter at the LeClaire Hotel, Moline, on the interesting subject of "Welding and Cutting—Elkonite and Carboloy."

Mr. Sieger had with him several samples of modern welding practice and cutting tools. He very interestingly and instructively moulded his subject about these pieces, citing many other outstanding performances and practical applications of these modern shop practices.

Welding is destined to replace much riveted construction, reducing the weight and increasing the strength and safety of our latest automobiles, tractors and other modern machinery. This in turn will effect a great saving in material and labor, giving us a more uniform product at reduced costs. He cited as one example that there are approximately one and one-half tons of rivets in a modern steel railway car. This means cutting a hole only to fill it again. By the newer methods of welding this waste of labor and material can be eliminated with a subsequent reduction in weight and cost and an increase in strength. The increased dependability we place on the brake drums and many other parts of our faster automobiles with free wheeling, etc., lends itself freely and effectively to this welded practice. Faster acceleration becomes possible because of the reduced weight in wheels and increased strength is accomplished.

We wish to move faster not only in our automobiles but in our up-to-date shop and machining operations. These newer tools will cut many times faster and more pieces per grind with increased accuracy, which accounts for the fact that we have uniformity in products. The "lemon" car is a thing of the past, even though we demand superperformance. Mr. Sieger warned, however, that these tools will not fit every need and, to be trite, are not a "cure-all." They have their place in the field and must have the proper application, in order to give satisfactory results.

Modern practices and requirements give us these facts. These newer tungsten tools have done much to give us the increased speed, dependability and safety to meet our multiplied demands.

HERTY INTERESTS BUFFALO MEMBERS

Steel Making Talk Pleases, and Stimulates Discussion

By Clyde Llewelyn

The seventh regular meeting of the Buffalo chapter was held at the Buffalo Hotel on March 10. Dinner was served to 26 members and guests and there were 92 present at the regular meeting which followed.

The meeting was called to order by Chairman J. H. Birdsong, who gave a short talk on the chapter's affairs, coming meetings and the National Metal Congress and Exposition, which is to be held in Buffalo next October. Past Chairman H. J. Cutler was then asked to introduce the speaker of the evening, who was Dr. C. H. Herty, Jr., supervisor of metallurgical section, U. S. Bureau of Mines experiment station, Pittsburgh. His subject was "Steel Making."

Dr. Herty gave a very interesting talk on this subject, confining it largely to methods of deoxidation in steel making, outlining results which had been obtained with the use of either silicon, manganese or aluminum and various alloyed combinations of two or more of these and other deoxidizing agents. He gave figures on the amount of time which should be allowed for deoxidizing and stated it was important that the depth of steel bath be taken into consideration when determining the length of time required.

In alloying manganese and silicon, for deoxidizing purposes, the speaker said the most suitable mixture had been found to be four to six parts manganese to one part silicon. It was stated that he thought aluminum, as a deoxidizing agent, represented a very fertile field for study, as it holds great possibilities provided a way can be found to eliminate the possibility of objectionable results, which are sometimes encountered, when some of this element, as such, remains in the finished steel.

The talk was illustrated with some very appropriate slides, and a great amount of interest was displayed, as evidenced by the fact that Dr. Herty was asked numerous questions, to all of which he gave satisfactory answers and explanations.

MILWAUKEE'S MARCH MEETING A SUCCESS

National President, Secretary Present; d'Arcambal Speaks

By R. N. Hurless

On March 17 the Milwaukee chapter had the pleasure of being visited by two national officers, A. H. d'Arcambal, president, and W. H. Eisenman, secretory.

During the afternoon R. S. Archer, J. Fletcher Harper and E. E. White conducted our visitors through the research department of the A. O. Smith Corp. Mr. d'Arcambal and Mr. Eisenman were delighted with the activities they saw and declared the Smith laboratories among the finest they have seen on their many trips about the country.

At four-thirty Secretary Eisenman called a meeting of the local executive committee. The meeting was held in the club rooms of the Hotel Schroeder. Later a delightful five course dinner was served.

The regular monthly meeting was held in the auditorium of the M. E. R. L. Co. shops. Chairman Ray Thiesenhusen presented our own J. Fletcher Harper who introduced Mr. Eisenman and Mr. d'Arcambal and then served as technical chairman of the evening. Mr. Eisenman greeted members and friends of the local chapter and very interestingly discussed the progress of the Society and the advantages of membership.

Mr. d'Arcambal was next presented and gave a real spirited talk on tool steels. A large group was present to hear Mr. d'Arcambal and engaged in a lively discussion following his talk. So interesting and educational was the lecture that the discussion had to be halted at a late hour to permit Mr. d'Arcambal and Mr. Eisenman to leave for St. Louis.

DARDALET CORP. GRANTS LICENSE

Holo-Krome Screw Corp., Hartford, has been licensed by Dardalet Threadlock Corp. to manufacture and sell socket head cap screws, hollow set screws, and countersunk pipe plugs threaded with the Dardalet self-locking thread.

BOSTON HEARS DISCUSSION OF THE DEEP DRAWING OF METALS

Crane Addresses April Meeting

By Howard E. Handy

About 175 members and guests of the Boston chapter attended the April 8 meeting at Massachusetts Institute of Technology to hear E. V. Crane, of E. W. Bliss Co., Brooklyn, discuss "The Deep Drawing, Blanking and Forming of Metals."

Mr. Crane discussed certain plastic theories in connection with typical press operations, showing samples of those operations, and then described recent developments in press equipment and automatic feeds. He also discussed to some extent, particularly from the theoretical standpoint, the selection of steels for dies and other forming tools, together with their design and heat treatment. His talk was fully illustrated.

Dinner was served in Walker Memorial, the guest speaker being Major P. H. Ottosen, U. S. Army, Coast Artillery, who presented an interesting coffee talk on "Anti-Aircraft Gunnery," illustrating his remarks with a series of slides showing the development and present status of anti-aircraft ordnance. The attendance at dinner was 60 members and guests.

LISTS METALS IN AIRCRAFT MOTORS

Pittsburgh Hears Fischbeck at Meeting in April

By Geo. P. Halliwell

The regular monthly meeting and dinner of the Pittsburgh chapter was held at the Keystone Athletic Association. The business meeting was preceded by a presentation of the motion picture film taken under the direction of Bruce A. Rogers and Leland Van Wert of the Harvard metallurgical laboratories, showing the thermal changes in steel and Armco iron from their melting points down through the lower critical ranges. Similar changes were shown in other alloys.

H. J. Fischbeck, metallurgist of Pratt & Whitney Co., was the speaker of the evening and gave a very excellent talk on the materials used in aircraft motors.

Mr. Fischbeck first gave a brief but clear and interesting sketch of the development of the airplane motor from the heavy, water cooled engines of the Wright brothers, having low horse power per unit weight ratio through the modern radial type air cooled engine, having a high horse power weight ratio. He then gave an excellent exposition of the various materials used in a modern airplane motor. To the metallurgist unfamiliar with the airplane industry it is surprising to note to what extent plain carbon steel and cast iron have been supplanted by the alloy steels and the light alloys of aluminum and magnesium, emphasizing the importance of a high strength weight ratio.

The materials and processing of them for use in the modern airplane motor as outlined by Mr. Fischbeck typify to the highest degree the application of our present day metallurgical science to industry.

AIR REDUCTION'S NEW RADIAGRAPH

Air Reduction Sales Co., 60 E. 42 St., New York City, announces the new Airco-D-B No. 4 Radiagraph, an oxy-acetylene machine which succeeds its No. 1-A Radiagraph. The new model is hailed as superior in design and performance. Details may be secured from the company.

PHILADELPHIA SEES VOCATIONAL SCHOOL

Inspects School's Equipment at Special April Meeting

By Adolph O. Schaefer

Last year there was gathered into the fold of the sustaining members of the Philadelphia chapter a large and flourishing institution on the other side of the river, known as the Camden County Vocational School.

Here boys and girls who are unable to continue their studies through high school or college are taught proficiency in whatever trade they may care to pursue. At the present time about 1500 pupils are being provided for, and over 400 are on a waiting list.

Since becoming a member of the chapter, the School has repeatedly invited the other members to partake of its hospitality and to hold a meeting in its buildings. On April 15 a special meeting of the chapter was held there.

About 70 members and guests gathered for dinner in the cafeteria of the school. The students in cafeteria cooking and management served the best dinner the chapter has had this year. It appears that there will be some wonderful cafeterias about town when the present lot of pupils get out in the world.

The various shops were thrown open for inspection. These include departments and equipment for the studying of carpentering and pattern making, printing, plumbing, horticulture and agriculture, machine shop, automobile repairing, aircraft repairing, bricklaying and masonry, and, to our satisfaction, tool making and heat treating! All of the facilities are complete and modern. The school was a revelation to those present, many of whom had never dreamed that such an institution existed.

The meeting was held in the school gymnasium. Dr. Boynton turned the meeting over to Mr. Hall, superintendent of the school; and to Mr. Higgins of the chapter, a native of Camden. Both greeted their guests of the evening very warmly.

The address of the evening was made by Mr. Mawby of the National Machinery Co. He displayed the motion picture, "Modern Forging Machinery." The picture and the talk that went with it were very well received by the large audience.

All in all the Philadelphia chapter's visit to Camden was a great success.

ELECRIC FURNACE CO. BUYS "PREECO" FURNACE BUSINESS

Moves Equipment to Salem, Ohio

Electric Furnace Co., Salem, Ohio, has purchased the business of the Process Engineering & Equipment Corp., Attleboro Mass., builders of "Preeco" bright annealing and controlled atmosphere furnaces. All equipment etc., of the Process Corp., has been moved to Salem, Ohio.

Electric Furnace Co. specializes on large production electric and fuel fired furnaces and material handling equipment for use in connection with furnaces.

Process Engineering & Equipment Corp. has been specializing on bright annealing and controlled atmosphere furnaces employing a principle which prevents oxidation and the formation of scale by the use of a gas, a mixture of gases, or a vapor to exclude air during heating and cooling.

J. F. Schrumn, formerly technologist of the Process Engineering & Equipment Corp., who has had wide experience in this line, is now connected with the Electric Furnace Co. at Salem, Ohio.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of THE REVIEW of the American Society for Steel Treating, Published monthly, except July and August, at Cleveland, Ohio, for April 1, 1932, State of Ohio, County of Cuyahoga, ss. Before me, a notary public, in and for the state and county aforesaid, personally appeared Ray T. Bayless, who, having been duly sworn according to law, deposes and says that he is the editor of THE REVIEW of the American Society for Steel Treating, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal laws and regulations to wit:

1.—That the names and addresses of the publisher, editor, managing editor, and the business managers are: Publisher, American Society for Steel Treating, 7016 Euclid Ave., Cleveland, Ohio; Editor, Ray T. Bayless, 7016 Euclid Ave., Cleveland, Ohio; Managing Editor, John G. Mapes, 7016 Euclid Ave., Cleveland, Ohio; Business Manager, W. H. Eisenman, 7016 Euclid Ave., Cleveland, Ohio.

2.—That the owner is: The American Society for Steel Treating, 7016 Euclid Avenue, Cleveland, Ohio, which is an educational institution, the officers being: President, A. H. d'Arcambal; Vice-President, W. B. Coleman; Secretary, W. H. Eisenman; Treasurer, A. T. Clarage; Directors, J. M. Watson, B. F. Shepherd, C. F. Pascoe, H. D. McKinney and F. B. Drake. All above officers of the American Society for Steel Treating, address at 7016 Euclid Avenue, Cleveland, Ohio.

3.—That known bondholders, mortgagees and other security holders are: none.

4.—That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. Ray T. Bayless, editor, sworn to and subscribed before me this 1st day of April, 1932.

(Seal) Arthur T. Wehrle, notary public. (My commission expires January, 1935.)

ROCKFORD STUDIES COPPER AND 18-8

Copper Alloys Feb. Subject; Stainless Covered in March

By L. J. Strohmeyer

The Rockford chapter's non-ferrous meeting for the 1931-1932 season was held in February. The speaker was H. M. Butterbaugh, technical supervisor for the American Brass Co., Kenosha Branch.

Mr. Butterbaugh first showed a motion picture which portrayed principally fabrication but also touched a little on the mining of the raw material.

After the showing of the movie he gave a short history covering the early copper mines.

In discussing alloys, Mr. Butterbaugh first considered brass. It is generally classed as high or low brass containing 80-90 and 65-70% copper respectively. To these alloys the addition of a small percentage of lead will increase machinability.

Bronze runs about 90% copper and 10% tin. Then there is phosphor bronze which contains a small percentage of phosphorus.

Everdur is a manganese bronze especially noted for corrosion resisting qualities. It is extensively used in making coils for hot water heaters.

Tempo, a copper silicon alloy susceptible to heat treatment, was perfected by the government. The heat treating process is accomplished by first heating and then quenching in water.

Cadmium bronze has been adapted very extensively to power transmission. Due to increased strength fewer towers are required for suspension which has netted quite a saving to power and telephone companies.

One of the more recent developments is the extrusion process whereby the metal is forced into dies or molds at high temperatures. In this way intricate designs have been produced which are used in the building and various other trades. This process was introduced by the American Brass Co. in 1901. It is interesting to note that for a period of one year 15,000,000 lb. of brass have been used for structural work.

For the March meeting the subject was "Stainless and Non-Corrosive Steel." The speaker was John S. Ewing of the Crucible Steel Co.

Mr. Ewing's talk was illustrated by chalk sketches. He explained that most failures were due to misapplication and cited a number of instances. It was stressed that knowing the material was of utmost importance to insure satisfactory results for any given application.

The second point was proper fabrication.

In connection with fabrication it was brought out that trouble is sometimes experienced due to carelessness. This is especially true where soldering is done. If care is not taken to clean off all the acid, rusting will result.

In welding, care must be taken when gas is used to have a neutral flame. If the flame is too reducing in nature the carbon has a bad effect. In the case of electric welding as well as with gas the welding rod must be the same as the metal to be welded.

A common misunderstanding which seems to prevail is that stainless steels when used for decorative purposes will remain clean indefinitely. However, like anything else, it must be washed regularly.

NORTHWEST TURNS OUT CROWD TO HEAR NATIONAL OFFICERS

March Meeting is Successful

By A. C. Forsyth

The Northwest chapter was especially fortunate to have the National President and National Secretary present at its March meeting. The meeting was held at the Radisson Hotel; a splendid dinner was served and our local secretary is to be congratulated upon the arrangement. However, even efficient secretaries are sometimes poor guessers and I am sure ours must have said to himself while waiting to be served, "I wonder why it is that some people insist on forgetting to make reservations?"

W. H. Eisenman was the first speaker. He outlined the purpose of the A.S.S.T. and told how its service to the individual and to industry has made it outstanding.

The president's lecture, "The Cutting of Metals" contained valuable information for every one. Since this excellent paper has been reviewed before, we need only say that it was enthusiastically received by this chapter.

The meeting was then opend for discussion in which many took part. Practical problems were considered and all were exceptionally interesting.

RECORD MEETING HELD BY ST. LOUIS CHAPTER ON MARCH 18

d'Arcambal and Eisenman Attend

By W. I. Potteiger

The program of the St. Louis chapter's March 18 meeting consisted of a special talk on the "Machining of Various Steels" by A. H. d'Arcambal, president of the National Society, and a short talk on the activities of the Society by W. H. Eisenman, our national secretary.

Previous to the talks before the chapter and its members and guests, the Executive Committee of the local chapter had a session with Messrs. d'Arcambal and Eisenman, to discuss ways and means of increasing the Society's activities in the 49th State.

The meeting was held in the American Hotel Annex and was attended by one of the largest turn-outs that the local chapter has ever had and Mr. d'Arcambal's talk was enthusiastically received.

R. M. Pease, general manager of the Axelson Mfg. Co., presided as chairman and introduced both the speakers.

KORP OUTLINES HARDENING RULES

Baltimore's March Meeting Devoted to Heat Treating

By S. Proctor Rodgers

Experienced metal treaters as well as novices were greatly benefited by the talk which Jordan Korp of Leeds and Northrup Co. gave at the March meeting of the Baltimore Group. His subject, "Procedure of Correct Hardening," was presented in that simple clear manner which is the gift of those of wide experience.

He pointed out that there were seven cardinal points to observe in the hardening of steel. If any one of these was not given proper attention the results would very likely be disastrous. Briefly they were as follows: 1. Sufficient time for heating; 2. Proper temperature for quenching; 3. Proper quenching medium: a—Large enough volume, b—Constant temperature, c—Correct character of liquid; 4. Time and temperature of tempering.

Mr. Korp gave numerous examples to illustrate the various points. Some of them were most humorous except for the deplorable conditions which they disclosed in some shops. Possibly the outstanding fault is the lack of understanding which exists between the management and the heat treater in regard to the length of time required to perform the heat treating operation.

The meeting was quite well attended and the members exhibited a lively interest in the discussion.

Chapters Offered Film About Optics

Bausch & Lomb Optical Co. has available for use at chapter meetings a remarkable motion picture dealing with the science of optics, the production of optical products and their applications. The picture should be of particular interest to the members of A.S.S.T.

"Eyes of Science" differs greatly from the ordinary industrial film in that the manufacturing story is minimized and the scientific aspect emphasized.

The first of the three reels deals with the science of optics and cleverly shows what happens to rays of light when they are passed through lenses, lens combinations and prisms. The light rays are made to pass slowly through space and optical systems, and are reflected and refracted with exceptional vividness. It is recommended because many of the shots, such as the Newton Ring phenomena and crystals under polarized light, are in color. The film is 3000 feet in length and total projection time is about 45 minutes.

As evidence of the excellence of the photography and subject material the "Movie Makers," after examining some 1000 films, awarded "Eyes of Science" first place among the ten best films of this type.

The film may be obtained free of charge by applying to the Bausch & Lomb Optical Co., Rochester, N. Y. Applications should be made well in advance, especially for the 35 mm. size, which contains the color shots. The 18 mm. reels are not in color.

THERMALLOY BULLETIN OFFERED

Bulletin 100 describing Thermalloy heat and corrosion resisting alloys manufactured by Electro-Alloys Co., Elyria, Ohio is available from that company.

NEW YORKERS LEARN INGOT'S INFLUENCE

Gathmann Shows How Design of Mold Affects the Steel

By F. H. Clark

The March meeting of the New York chapter was held on the 21st with dinner served at Loft's restaurant and the meeting held afterwards in the Woolworth Building. The speaker for the evening, E. A. Gathmann, president of the Gathmann Engineering Co., Baltimore, gave an address on "The Relation of Ingot Design to Quality Steel."

Mr. Gathmann believes an ingot mold with the big end up is necessary, as the surging action inside the ingot during solidification forces the gases up towards the big top. In small top ingots, these gases are entrapped, causing many defects in the solid metal.

Principal defects in steel ingots are pipe or cavity, a spongy center, flow holes, cleavage planes and surface cracks.

The ladle burden must not be too great, otherwise the molten metal splashes into the ingot mold so hard that solidification takes place on the side, causing oxidation and subsequent blow holes.

Mr. Gathmann said that mold washes are only a small help and that pouring slowly was more important. Tar should be applied only to a hot mold, so that it will be uniform. The chief objection to the use of tar is that it forms gases and therefore hard spots in the ingot. All molds should be heated to 250-300° F. Care must be taken to have them dry, as moisture will cause pin holes on the surface of an ingot.

The shape of the mold is also most important according to the speaker, as this factor affects the surface. The corners must be such as not to cause cracking. The surface of the solidifying steel must be free to contract. The surface of an ingot is much improved if a many sided mold, such as an octagon or dodecahedron, could be utilized, but the expense of rolling this type is too great. Subcutaneous cracks caused by severe stresses in the surface would tend to be eliminated by this method. These are particularly dangerous, as they are inclined to open up under repeated stress.

Mr. Gathmann said that he hoped to see the time when rails and structural shapes would be cast with the big end up, as he thought certain difficulties and failures might be eliminated thereby. Transverse fracture of steel rails is one type of failure which might be greatly reduced.

WASHINGTON LEARNS OF MAKING SPRINGS

R. W. Cook Describes Design, Testing and Treating

By W. R. Angell

"Design, Manufacture and Use of Springs" was the subject presented by R. W. Cook, vice-president and factory manager of Wallace Barnes Co., Bristol, Conn., at the monthly meeting of the Washington chapter held April 14. About 20 members and guests met Mr. Cook around the dinner table before proceeding to the Interior Department Building where the technical session was held.

Election of officers for the coming year was the next order of business. Lewis H. Fawcett of the Naval Gun Factory was elected to the chairmanship for 1932-1933, and Louis Jordan of the Bureau of Standards was elected vice-chairman.

The importance of springs in our daily routine was emphasized by Mr. Cook. Their design, manufacture and testing were explained in detail. Some springs such as those used in clocks where the service or winding is relatively infrequent, are heat-treated and fabricated to give a troostitic structure. Drawing or tempering of these springs will increase their life. The range of stresses must also be considered as the fatigue limit or life varies inversely to this.

The manufacturing tolerances of springs are most important. Variations in rolling the strip, eccentricity of rolls, improperly ground rolls, and hot gauging must be properly controlled. In the case of a flat clock spring, a variation of 0.001 in. in thickness would give a load variation of 15% or 8½% deviation in the timing qualities.

Reference was also made to the low temperature treatment of piano wire at about 500° F which results in increased elastic limit.

Mr. Cook's talk was well illustrated with slides and charts.

CINCINNATI HOLDS SEASON'S GREATEST MEETING APRIL 1

d'Arcambal and Eisenman Present

By N. C. Strohmenger

A. H. d'Arcambal, president of the A.S.S.T., and W. H. Eisenman, national secretary, were present at the meeting of the Cincinnati chapter held on April 1.

Mr. Eisenman spoke to us briefly regarding the Society. He started out by telling us in a very jovial way of his recent experiences in traveling around with Mr. d'Arcambal. Then he became more serious and told us about the offers of the Society for its membership. This was very clearly brought out by a number of slides that were shown.

The technical speaker of the evening was Mr. d'Arcambal, who spoke on "Carbon, Alloy and High Speed Tool Steels." This most instructive talk has been abstracted before in the REVIEW.

The lecture was accompanied by a display of tools which made it very interesting. The long discussion which followed was of unusual value.

Without doubt this was the best attended meeting of the year, but it is too bad that even more were not present.

TELLS HISTORY OF PLATING

George Stoll Tells Notre Dame Group About Chrome Plating Especially

By Vance N. Uhlmeyer

George Stoll, of Bendix Corp., South Bend, Ind., gave a very interesting talk on "Deposition of Metals and Chrome Plating," before the Notre Dame group on the evening of April 21, in the Metallurgy auditorium of the Engineering building.

Mr. Stoll traced the history of electro-plating from its infancy to the present modern processes of depositing metals for practical and ornamental uses. He enumerated the different types of baths, and the various forms of control which will give the most efficient plating results, placing special emphasis on chrome plating, and chrome plating over cadmium.

INDIANAPOLIS MET APRIL 4

A. S. S. T. President and Secretary Speak To Over 50 Members and Guests

By A. E. Focke

The April meeting of the Indianapolis chapter was held in the Severin Hotel, April 4. National Secretary W. H. Eisenman showed the advantages of membership in our Society.

A. H. d'Arcambal, president of A.S.S.T., delivered the principal talk on "Machinability of Metals." This fine talk has been reviewed before and it is therefore only necessary to say that it was well received.

About 50 members and guests attended the dinner and several more came in for the talk and discussion.

CARBIDE TOOLS ARE CHICAGO'S SUBJECT

Curtis Tells 300 at Meeting of Their Status Today

By B. J. Hamerly

The April meeting of the Chicago chapter was attended by about 300 members and guests. The meeting was opened by Chairman Colwell who introduced Mr. Skeen, chairman of the Chicago section, A.I.M.E. He gave a brief talk on bringing the two Societies together more often as they both had so much in common, as far as co-operation was concerned.

Claire O. Musser gave a talk on musical instruments made by J. C. Deagon Company where he is doing consulting work. He also mentioned that a Michigan firm was manufacturing a 98% aluminum violin for $50.00, even better than one made from wood at a cost of $5,000. Mr. Musser rendered several selections which were well received by all.

The principal speaker of the evening was Frank W. Curtis of Kearney & Trecker, manufacturers of milling machines and inserted tungsten and tantalum carbide tipped cutters.

Milling machines were designed to meet the modern trend of progress. Testing for vibration, etc., was very important as this was a major factor in the success of carbide tipped tools.

Mr. Curtis also mentioned that there were 40,000 different leads available on their modern machine.

Tungsten carbide was first known about ten or twelve years ago, being used at first for drawing dies, but in the past three or four years, it has been used for metal cutting tools. In the beginning, due to the lack of proper equipment and knowledge, carbide tipped tools were not as successful as today.

Their initial costs are small compared to the increased production; where applications are practical the returns fully justify the extra tool cost.

Mr. Curtis stated that the vital point was rigidity in fixtures for holding work, as well as machine tool design. This was shown in slides and also moving pictures.

Following the speaker's talk, there was a very active discussion and the meeting adjourned with the usual vote of thanks.

CORRECTION

In the April issue of the REVIEW the account of the March meeting of Boston chapter contained a mistake in the business connection of the speaker, Oliver Smalley. Mr. Smalley is director of research of Gray Iron Institute, Inc., Cleveland.

Morehouse Machine Co., York, Pa., has prepared a folder illustrating and describing its proving instruments for checking materials testing machines. Copies are available.

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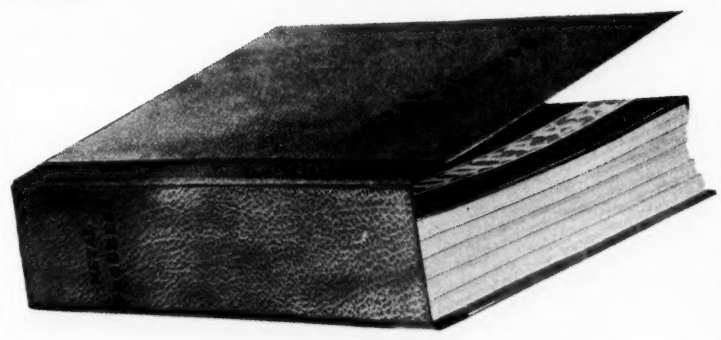

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ONTARIO MEMBERS DISCUSS FURNACES

J. A. Doyle Talks to 100 About Proper Operating Practice

By J. W. McBean

The March meeting of the Ontario chapter of the A.S.S.T. was held in the Royal Connaught Hotel in Hamilton on March 4, with an attendance of about 100. One of the past chairmen of the chapter, Hugh Davis, gave us a coffee talk on "Bio-Chemistry" and was then followed by J. A. Doyle of the W. S. Rockwell Co., whose subject was "Fuels and Furnaces from the User's Point of View."

Mr. Doyle emphasized very strongly some of the things we should know but are either apt to forget entirely, or at least not remember the importance of. No one form of furnace or fuel is the best for all purposes, all of them have been used to produce good results in the manufactured article, and this is, of course, the final test.

For some special purpose a particular fuel may be indicated as for instance, electricity for local heating, but in general the quality of the work, the cost of production, and the working conditions all have to be considered and balanced.

Such features as automatic temperature control are very useful but the value in all cases must be determined by the product itself. The time element is as important as the temperature of the furnace and this is affected by the mass, shape and surface of the object as well as the position relative to other parts in the furnace. If uniform results are to be obtained, uniform exposure must be secured and large batches of material not uniformly exposed may result in a lot of poor work.

With regard to economy of operation of a furnace, the efficiency of a burner is only part of the story and it is just as important to utilize the heat fully after it is generated. In this connection dampers may play as important a part as they do in ordinary house furnaces and various methods of retaining the heat have a value, not only in the treatment of the metal, but also in prolonging the life of the furnace linings, as quick changes of temperature have a very bad effect on these.

In general it is not good practice to let a flame hit the work directly but on the other hand the use of a muffle to secure this result is not usually economical unless the furnace is kept going night and day.

A number of these and other interesting points were brought out in the discussion which followed the talk.

William Cooley, formerly sales manager for Hevi Duty Electric Co., has accepted a position in the continuous heat treating division of Surface Combustion Corp. He is engaged in sales activities. Mr. Cooley has been associated with the metal working industries since 1918. Prior to his connection with Hevi Duty Electric Co., Mr. Cooley was affiliated with Industrial Electric Furnace Co. and Westinghouse Electric & Manufacturing Co. He was graduated from Purdue University in 1917 with the degree of Bachelor of Science in Electrical Engineering.

LUERSSEN TELLS BALTIMORE HOW TO TREAT TOOL STEELS

Addresses Chapter in April

By S. Proctor Rodgers

At their April meeting the Baltimore group enjoyed a very informative talk on the "Design and Heat Treatment of Tool Steel" by G. V. Luerssen of the Carpenter Steel Co.

Mr. Luerssen first explained the usual classification of such steels into water, oil and air hardening. He then pointed out that selection of the proper steel for the job depended upon three factors: Its ability to harden satisfactorily after forming into the finished tool, its performance under service, and its cost.

When the proper steel has been selected, the first step only has been taken. It must now be heat treated, bearing in mind what Mr. Luerssen called the "foundations of proper heat treating." These he stated, were the furnace, the particular steel's characteristics, and the quenching medium. The important factors to be considered in connection with the furnace are atmosphere and heat distribution. With the steel we must always keep in mind its critical quenching speed and size changes when hardened. The quenching both must be free from gas and steam pockets if the tool is to be uniformly hardened.

SHOWS HOW NICKEL AFFECTS CAST IRON

Coyle Speaks at Rockford Chapter's March Meeting

By L. J. Strohmeyer

The main speaker for the March meeting of the Rockford chapter was F. B. Coyle of International Nickel Co. who spoke on "Recent Developments in the Application of Cast Iron."

Some specific alloys of cast iron were then discussed. Nihard, one of the alloys consisting of 4½% nickel and 1½% chromium is a high strength alloy with a high Brinell. Another alloy mentioned was Niresist. The feature of this is its resistance to corrosion.

Coming back to plain cast iron it was explained that when subjected to heat the growth was from 30 to 40% of the original size. A careful check was made on growth of the different alloys when subjected to heat treatment in various atmospheres. This showed that Niresist was very low in every case. This alloy contains percentages of nickel, copper, chromium and silicon.

A rather interesting bit of information in regard to application was in connection with dies. A record was kept where the dies were of plain cast iron. Then with an alloy it was found the life was 3 to 4 times that of plain iron and with heat treated alloy 40 times that of plain cast iron.

After a lively discussion which was lead by Duncan Forbes of the Gunite Foundries Corp., Rockford, Mr. Forbes gave a brief but interesting talk on Z-Ron, a cast metal of unusual metallurgical characteristics which can be substituted for cast steel and forgings.

YORK VISITS LAB; HEARS V. LAWRENCE

Open Hearth Control Subject of April Technical Talk

By Arthur W. F. Green

The April 13 meeting of the York chapter was held in Harrisburg, Pa. This meeting was preceded by a dinner held at the Penn Harris Hotel and was attended by forty members and guests of the chapter.

A coffee talk was presented by H. Mattimore, chief engineer in charge of the research laboratories of the Pennsylvania Department of Highways. Mr. Mattimore's talk on "Research in Road Building Problems" outlined the work done by the laboratories. He also described some of the work that is being done by the laboratories in soil research.

The group was then directed to the research laboratories where a visitation program was put into effect. About 85 were then present. Small groups were assigned to a guide and then started through the several departments of the laboratories. These included departments on cement and concrete test and preparation work, on soil and soil analyses, physical tests in general, and very complete chemical control laboratories.

The meeting was held in the main corridor of the research laboratories. It was called to order by Chapter Chairman George J. O'Neill. The meeting was then turned over to the program committee under the direction of Arthur Green, who introduced the speaker of the evening, Victor H. Lawrence, metallurgical engineer of Alan Wood Steel Co., who gave an illustrated talk on the subject of "Open Hearth Control."

Mr. Lawrence's talk centered around the metallurgical control features in use by his company. This is built upon a program whereby trained metallurgical observers are present in the open hearth plant, on the floor, in the pit, as well as in the laboratory, to make tests during the entire process of manufacturing open hearth steel. Their reports are tabulated so that the history of every heat of steel is most complete. The details which are thus made available have proven of great help.

A very interesting discussion followed Mr. Lawrence's paper.

CLEVELAND HEARS SURVEY OF METALS

Dr. Harder Tells Past and Future of Metallurgy

By H. B. Pulsifer

On April 4 the Cleveland chapter had its monthly meeting at the Cleveland Club with 60 at dinner and 175 present for Dr. Harder's address.

Immediately after the dinner Chairman Benninghoff introduced W. H. Way who related a grist of amusing and instructive anecdotes concerning the history and practice of the manly art of "golf."

Chairman Benninghof then asked for a financial statement from the treasurer and Professor Boylston thanked the chapter for its contribution of $100 toward the cost of a new laboratory electric furnace that he is putting into service at Case School.

E. M. Slaughter of the nominating committee was then asked to report on the slate of officers for the next year. Without opposition the following list was presented and duly elected.

Chairman, Kent R. Van Horn; vice-chairman, E. F. Ross; secretary-treasurer, H. B. Pulsifer; executive committee, the above with W. P. Sykes, H. F. Vlchek, W. L. Benninghoff, Carl Harvey, H. P. Croft, J. S. Ayling, Gordon Williams, C. G. Shontz and W. E. Benninghoff.

The chairman then presented Dr. Oscar E. Harder, of Battelle Memorial Institute, who spoke on the "Metallurgy of Yesterday, Today, and Tomorrow." Because of his intimate contact with research activities, Dr. Harder was able to outline the advance that is being made in practically every field of metal progress.

Touching on a large number of metals and alloys, and covering the industrial fields from cast iron to jewelry, Dr. Harder mentioned the significant compositions and properties that are lining up for the metal of the future. The need for detailed and painstaking work in both the theoretical and plant laboratories was stressed. Much of the work is so difficult and costly that co-operative research appears the only method for success.

SYRACUSE HEARS HOW TO BUY TOOL STEEL

S. C. Spalding Tells Chapter Best Methods on April 11

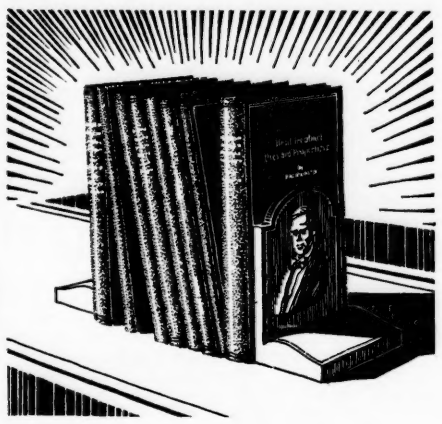
By J. M. Hutton

S. C. Spalding, of American Brass Co., read a paper on "The Tools and the Steels" before the Syracuse chapter on April 11. Typical order forms for steel, which have been developed by the American Brass Co., were shown on the screen. The type of steel is given, and for what it is to be used. The approximate analysis follows and the general purchasing conditions stated. The Brinell hardness, heat treatment and physicals, together with tolerances to suppliers, are also stated.

This method of ordering simplifies the purchasing of large quantities of the various types of steel. It often happens after a tool has been made and heat treated, that, due to some hidden flaw in the steel or because the steel hardened too deeply, or vice versa, the tool fails. The causes can be practically eliminated by proper inspection of the steel when received and a knowledge of its physical properties.

In large concerns, where the purchasing department is ordering steel of one brand for one department and another brand for another (both to be used on similar work) a mix-up ensues and this is where the metallurgist steps in and forms the connecting link. From his knowledge and the facilities he has for testing the steels, he can decide which is the best brand and prepare specifications which simplify the ordering, and eliminate some of the hazards previously mentioned.

It should be borne in mind that when etching steels for examination, they should be given the same unit of time in the etching medium. The temperature should be constant so that an actual comparison can be made. In the heat treatment of tool steels, correct types of furnaces and quenching media are of the utmost importance if the best results are to be obtained. Consideration should be given the grinding operations, correct speeds and type of wheels are essential.



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Principles of Heat Treatment of Steel by the **Metallurgical Staff, Bureau of Standards**
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Heat Treatment, Uses and Properties of Steel by **H. B. Knowlton**
Assistant Chief Metallurgist of International Harvester Co. covers the various plain carbon and alloy steels, their selection and properties obtainable by various treatments. The author goes at length into the peculiarities of each steel, methods and equipment for handling, carburizing, heat treating and cleaning.

The Constitution of Steel and Cast Iron by **Frank T. Sisco**
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Inclusions in Iron by **Dr. C. R. Wohrman**
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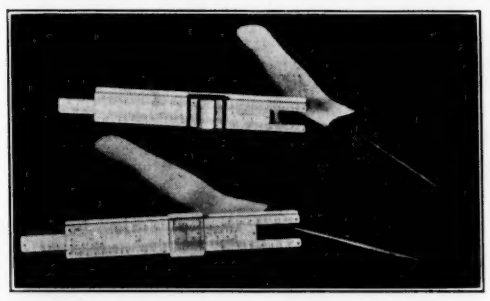

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